

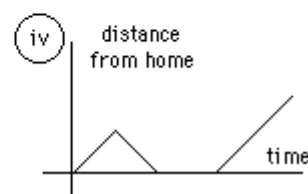
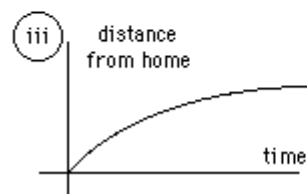
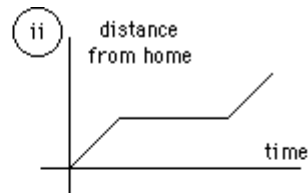
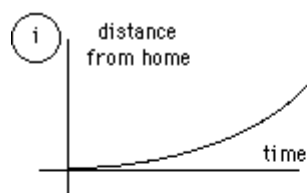
# AP Environmental Science Graph Prep

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## Practice Interpreting Data:

The following questions are to help you practice reading information shown on a graph. Answer each question on the separate answer sheet.

1. Identify the graph that matches each of the following stories:
  - a. I had just left home when I realized I had forgotten my books so I went back to pick them up.
  - b. Things went fine until I had a flat tire.
  - c. I started out calmly, but sped up when I realized I was going to be late.



2. The graph at the right represents the typical day of a teenager. Answer these questions:
  - a. What percent of the day is spent watching TV?
  - b. How many hours are spent sleeping?
  - c. What activity takes up the least amount of time?
  - d. What activity takes up a quarter of the day?
  - e. What two activities take up 50% of the day?
  - f. What two activities take up 25% of the day?

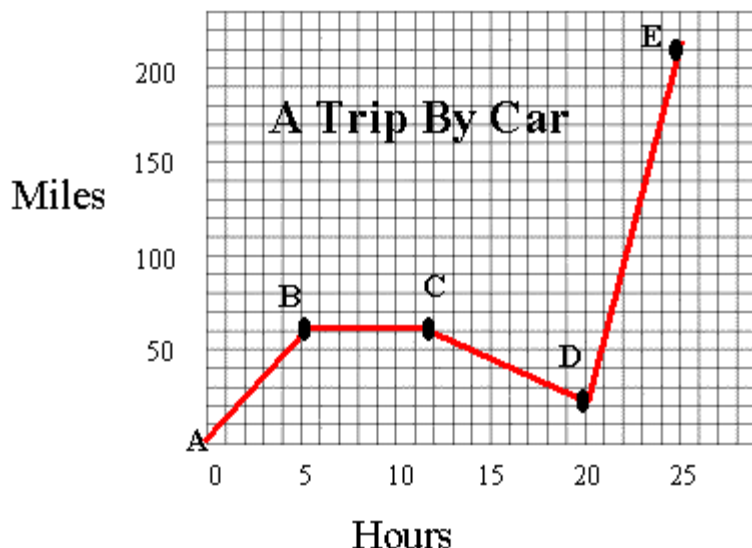


3. Answer these questions about the graph at the right:
  - a. How many sets of data are represented?
  - b. On approximately what calendar date does the graph begin?
  - c. In what month does the graph reach its highest point?



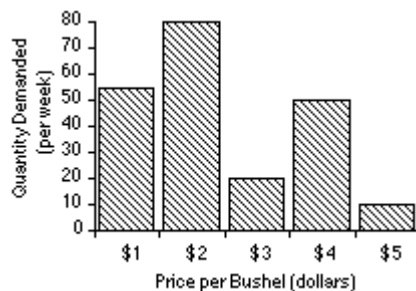
4. Answer these questions about the graph on the right:

- How many total miles did the car travel?
- What was the average speed of the car for the trip?
- Describe the motion of the car between hours 5 and 12?
- What direction is represented by line CD?
- How many miles were traveled in the first two hours of the trip?
- Which line represents the fastest speed?



5. Answer these questions about the graph at the right:

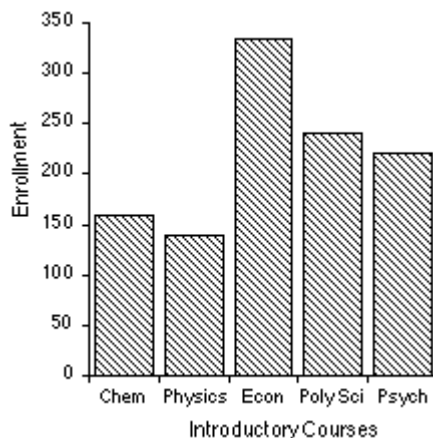
- What is the dependent variable on this graph?
- Does the price per bushel always increase with demand?
- What is the demand when the price is \$5 per bushel?



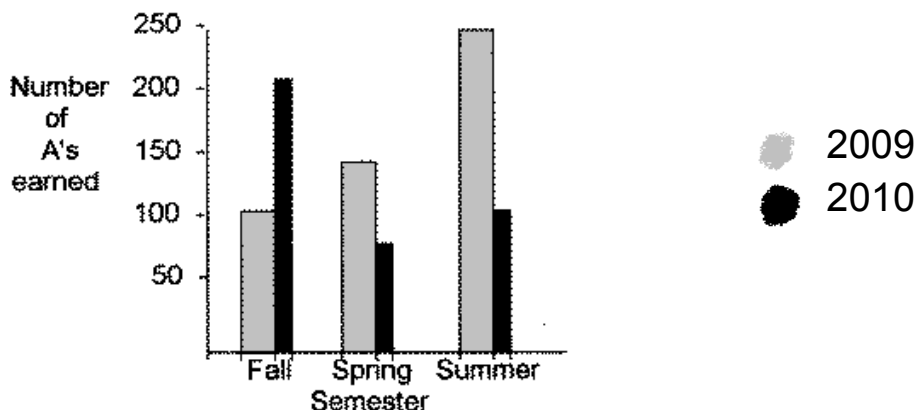
6. The bar graph below represents the declared majors of freshman enrolling at a university.

Answer the following questions:

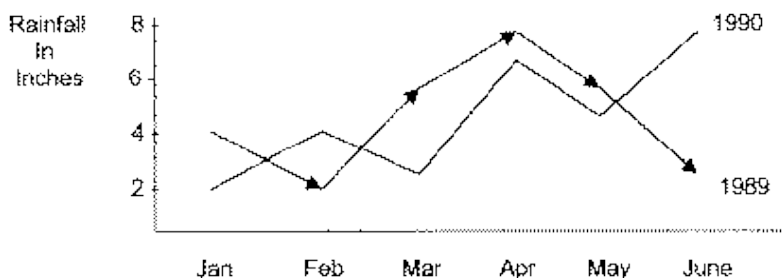
- What is the total freshman enrollment of the college?
- What percent of the students are majoring in physics?
- How many students are majoring in economics?
- How many more students major in poly sci than in psych?



7. This graph represents the number of A's earned in a particular college algebra class. Answer the following questions:
- How many A's were earned during the fall and spring of 2009?
  - How many more A's were earned in the fall of 2010 than in the spring of 2010?
  - In which year were the most A's earned?
  - In which semester were the most A's earned?
  - In which semester and year were the fewest A's earned?



8. Answer these questions about the graph below:
- How much rain fell in Mar of 1989?
  - How much more rain fell in Feb of 1990 than in Feb of 1989?
  - Which year had the most rainfall?
  - What is the wettest month on the graph?



9. Answer these questions about the data table:

- What is the independent variable on this table?
- What is the dependent variable on this table?
- How many elements are represented on the table?
- Which element has the highest ionization energy?
- Describe the shape of the line graph that this data would produce?

Atomic Number	Ionization Energy (volts)
2	24.46
4	9.28
6	11.22
8	13.55
10	21.47

10. Answer the following using the data table below:

- How many planets are represented?
- How many moons are represented?
- Which moon has the largest mass?
- Which planet has a radius closest to that of Earth?
- How many moons are larger than the planet Pluto?
- Which of Jupiter's moons orbits closest to the planet?
- Which planet is closest to Earth?

Solar System Data Table

	Distance	Radius	Mass	
Name	Orbits	(000 km)	(km)	(kg)
-----	-----	-----	-----	-----
Sun			697000	$1.99 \times 10^{30}$
Jupiter	Sun	778000	71492	$1.90 \times 10^{27}$
Saturn	Sun	1429000	60268	$5.69 \times 10^{26}$
Uranus	Sun	2870990	25559	$8.69 \times 10^{25}$
Neptune	Sun	4504300	24764	$1.02 \times 10^{26}$
Earth	Sun	149600	6378	$5.98 \times 10^{24}$
Venus	Sun	108200	6052	$4.87 \times 10^{24}$
Mars	Sun	227940	3398	$6.42 \times 10^{23}$
Ganymede	Jupiter	1070	2631	$1.48 \times 10^{23}$
Titan	Saturn	1222	2575	$1.35 \times 10^{23}$
Mercury	Sun	57910	2439	$3.30 \times 10^{23}$
Callisto	Jupiter	1883	2400	$1.08 \times 10^{23}$
Io	Jupiter	422	1815	$8.93 \times 10^{22}$
Moon	Earth	384	1738	$7.35 \times 10^{22}$
Europa	Jupiter	671	1569	$4.80 \times 10^{22}$
Triton	Neptune	355	1353	$2.14 \times 10^{22}$
Pluto	Sun	5913520	1160	$1.32 \times 10^{22}$

## Practice Making Graphs:

Use the following steps to create graphs and answer questions for each of the problems below. All your work will go on the separate answer sheet.

1. *Identify the variables. The independent variable is controlled by the experimenter. The dependent variable changes as the independent variable changes. The independent variable will go on the X axis and the dependent on the Y axis.*
2. *Determine the variable range. Subtract the lowest data value from the highest data value.*
3. *Determine the scale of the graph. The graph should use as much of the available space as possible. Each line of the scale must go up in equal increments. For example, you can go 0, 5, 10, 15, 20, etc. but you cannot go 1, 3, 9, 34, 50, etc. Increments of 1, 2, 5, 10, or 100 are commonly used but you should use what works best for the given data.*
4. *Number and label each axis.*
5. *Plot the data. If there are multiple sets of data on one graph, use a different color for each.*
6. *Draw a smooth, best-fit line for each data set.*
7. *Title the graph. Titles should explain exactly what the graph is showing and are sometimes long. Don't be afraid of a long title!*
8. *Create a key to the graph if there is more than one set of data.*

### Problem 1

Age of the tree in years	Average thickness of the annual rings in cm. Forest A	Average thickness of the annual rings in cm. Forest B
10	2.0	2.2
20	2.2	2.5
30	3.5	3.6
35	3.0	3.8
50	4.5	4.0
60	4.3	4.5

*The thickness of the annual rings indicate what type of environmental situation was occurring at the time of its development. A thin ring, usually indicates a rough period of development. Lack of water, forest fires, or a major insect infestation. On the other hand, a thick ring indicates just the opposite.*

- A. Make a line graph of the data.
- B. What is the dependent variable?
- C. What is the independent variable?
- D. What was the average thickness of the annual rings of 40 year old trees in Forest A?
- E. Based on this data, what can you conclude about Forest A and Forest B?

## Problem 2

pH of water	Number of tadpoles
8.0	45
7.5	69
7.0	78
6.5	88
6.0	43
5.5	23

- A. Make a line graph of the data.
- B. What is the dependent variable?
- C. What is the independent variable?
- D. What is the average pH in this experiment?
- E. What is the average number of tadpoles per sample?
- F. What is the optimum water pH for tadpole development?
- G. Between what two pH readings is there the greatest change in tadpole number?
- H. How many tadpoles would you expect to find in water with a pH reading of 5.0?

## Problem 3

Amount of ethylene in ml/m <sup>2</sup>	Wine sap Apples: Days to Maturity	Golden Apples: Days to Maturity	Gala Apples: Days to Maturity
10	14	14	15
15	12	12	13
20	11	9	10
25	10	7	9
30	8	7	8
35	8	7	7

Ethylene is a plant hormone that causes fruit to mature. The data above concerns the amount of time it takes for fruit to mature from the time of the first application of ethylene by spraying a field of trees.

- A. Make a line graph of the data.
- B. What is the dependent variable?
- C. What is the independent variable?